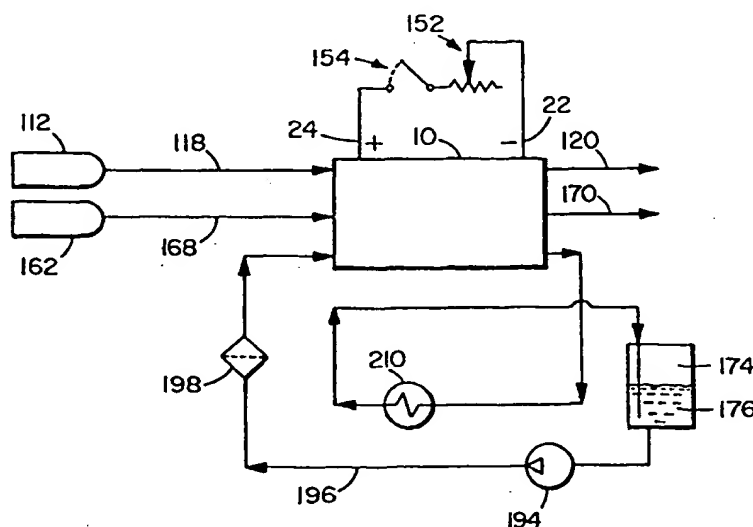




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H01M 8/04, F01P 11/06, B60L 11/18		A1	(11) International Publication Number: WO 00/17951
			(43) International Publication Date: 30 March 2000 (30.03.00)
(21) International Application Number: PCT/CA99/00850		(74) Agent: DE KOCK, Elbie, R.; Russell Reyneke, Two Bentall Centre, Suite 700, 555 Burrard Street, Vancouver, British Columbia V7X 1M8 (CA).	
(22) International Filing Date: 17 September 1999 (17.09.99)			
(30) Priority Data: 198 43 401.4 22 September 1998 (22.09.98) DE 2,247,856 23 September 1998 (23.09.98) CA		(81) Designated States: AU, CA, DE, GB, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
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(54) Title: ANTIFREEZE COOLING SUBSYSTEM



(57) Abstract

Liquid cooled systems having coolant circulation loops (136) must often operate in below freezing conditions. For instance, in various applications certain fuel cell systems (10) must be able to tolerate repeated shutdown and storage in below freezing conditions. Conventional glycol-based coolants typically used for internal combustion engines are generally unsuitable for use in the associated fuel cell cooling subsystems due to the presence of additives and/or inhibitors which are normally included to deal with problems relating to decomposition of the glycol. With additives or inhibitors present, the coolant conductivity can be sufficiently high as to result in electrical shorting or corrosion problems. However, provided the purity of the coolant is maintained, a pure glycol and water coolant mixture may be used as a fuel cell system coolant to obtain suitable antifreeze protection. Adequate purity can be maintained by including an ion exchange resin unit (158) in the cooling subsystem.

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